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PROGRESS

of the

Barberry Eradication Campaign

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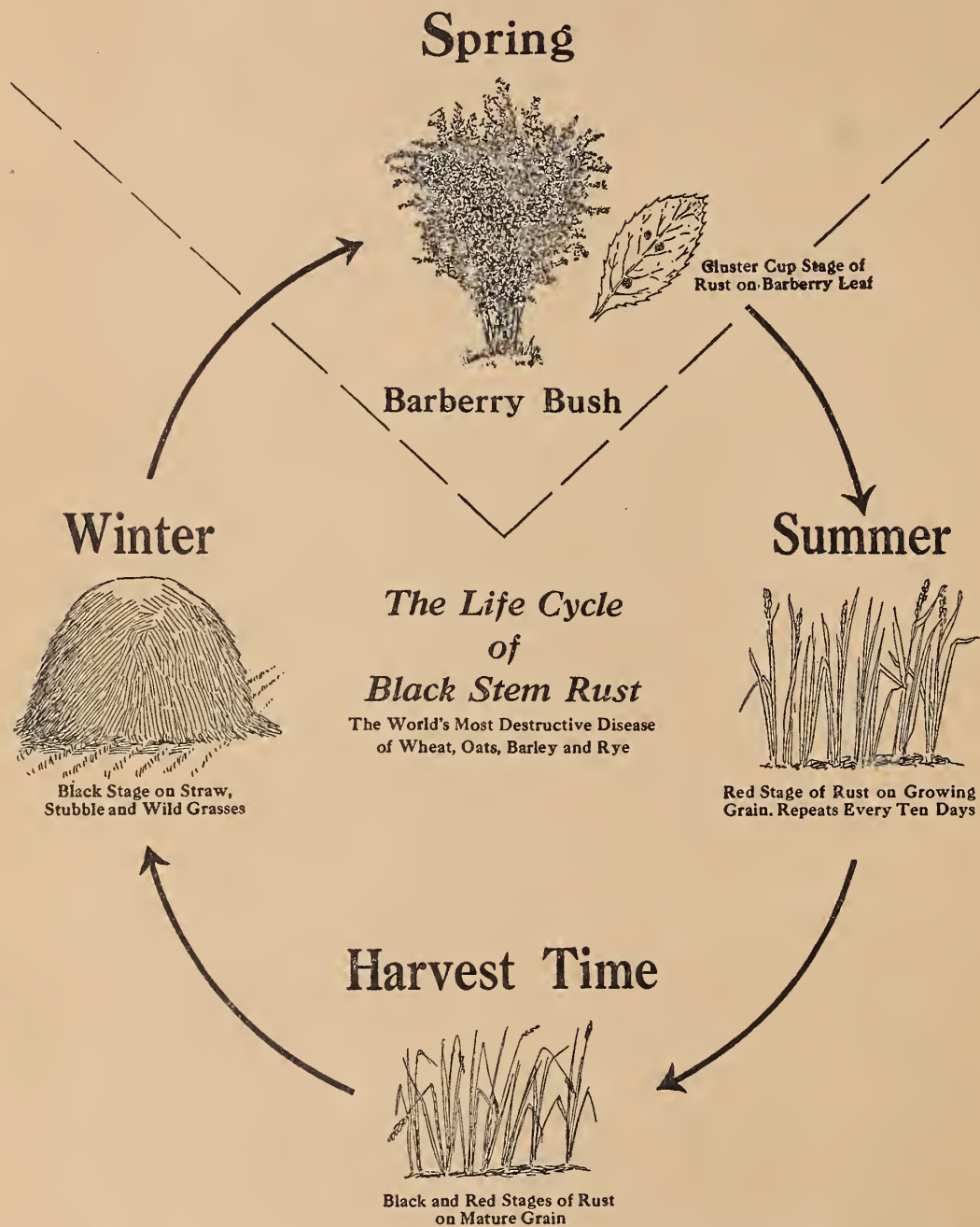
COLORADO in 1929



Our Grain Crops Must Be Protected from Black Stem Rust

Barberry Eradication Pays

Remove the Barberry and Break the Rust Cycle



All Common Barberries act as starting points for Black Stem Rust early each spring. By destroying the barberry the early spring source of black stem rust is eliminated. The Common Barberry provides a means to bridge the gap between the black stage on grain in the fall and the red stage of the rust on grains and grasses the following spring.

**BOOST BARBERRY ERADICATION—A PRACTICAL RUST
CONTROL MEASURE**

PROGRESS OF THE BARBERRY-ERADICATION CAMPAIGN

IN COLORADO, 1929

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Office of Barberry Eradication^{2/}, Bureau of Plant Industry,

United States Department of Agriculture

Introduction

Black stem rust is the most destructive disease that attacks the small-grain crops of Colorado. Enormous losses have been experienced by grain growers in past years. Estimates by the United States Department of Agriculture place the average annual loss of wheat from stem rust, in the six-year period 1915 to 1920, at more than 50,000,000 bushels in 13 of the principal wheat-producing States. In the nine-year period from 1921 to 1929 the average annual loss has been reduced to less than 16,000,000 bushels, an average reduction of about 34,000,000 bushels each year. In Colorado this reduction has been in similar proportion, and the loss this year due to stem rust was estimated at 56,000 bushels for all grains. The decrease in the losses has been proportionate to the number of common barberry bushes destroyed.

Common Barberry a Host for Black Stem Rust

Black stem rust is caused by a fungus, a microscopic plant, which spends part of its life growing on grain plants and the other part growing on the common barberry bush. It is chiefly from the barberry that the rust fungus gets its start on the grains early in the spring. Once started from this source, and under favorable conditions, the rust spreads very rapidly, appearing in the fields as red rust. This continues throughout the growing season of the grain plants, and as they commence to ripen the rust fungus produces the black stage which is so familiar to us all. In this black stage the rust over-winters on old straw or stubble; it germinates in the early spring, and the spores or seeds infect the leaves of the common barberry bush. Complete eradication of the common barberry in Colorado will eliminate the principal source of stem rust infection in this State.

Learn to Recognize the Common Barberry

It is urged that the people of Colorado learn to recognize the common barberry (Berberis vulgaris L.) and report all findings to the Botany

^{1/} State Leader of Barberry Eradication in Colorado.

^{2/} From the beginning of the campaign in 1918 until January 1, 1930, barberry eradication was a project of the Office of Cereal Crops and Diseases, of the Bureau of Plant Industry. On January 1, 1930, the Office of Barberry Eradication was established as a separate unit of the Bureau.

Department of the Colorado Agricultural College, Fort Collins, Colo. The barberry is an erect shrub often growing to a height of 14 feet. The outer bark is grayish and the inner bark is yellow. The roots have a very marked yellow color. Spines occur along the stems, usually in groups of three or more. The leaves grow in clusters, are green or purple in color, and have saw-toothed edges. The yellow flowers and red berries are borne in bunches like those of currants.

The Japanese barberry (Perberis thunbergii DC.) does not spread rust and should not be destroyed. It is a beautiful shrub, is well adapted to landscaping, and makes a fine hedge.

Organization and Personnel

The barberry-eradication campaign in Colorado was organized in 1918 as a cooperative Federal and State project to eradicate the common barberry. The campaign is directed by a State Leader with headquarters at the Colorado Agricultural College, Fort Collins, Colo.

The 13 principal grain-growing States of the North and Northwest are engaged in the campaign, namely, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Nebraska, South Dakota, North Dakota, Montana, Wyoming, and Colorado.

Besides the State Leader, four or five men are employed for a period of three to four months each summer. Usually they are selected by the State Leader from the plant pathology class of the College, and after being passed on by the State advisory committee, composed of local agricultural leaders, their names are proposed to the Washington office. The men are thoroughly trained in methods of barberry eradication before going into the field. It has been a practice to hire men with from three to four years of college training. Experienced men are given preference provided their previous work has been satisfactory.

Financing

The campaign in Colorado is supported chiefly by the funds of the United States Department of Agriculture, nearly all of which is spent on field survey. In 1929 the allotment for this work was \$5,000.

Much valuable indirect aid is given by the College of Agriculture and other cooperating agencies.

All Known Methods of Rust Control Must Be Employed

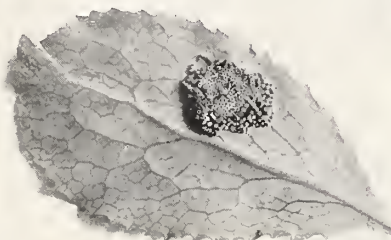
While barberry eradication is of first importance, there are several known methods for reducing losses due to stem rust. Early sowing of grain, proper preparation of the seed bed, avoidance of low, poorly drained land, proper use of fertilizers, in fact, anything that promotes early ripening of the grain, will help reduce the danger from rust.

BLACK STEM RUST SPREADS FROM COMMON BARBERRIES



to Wheat, Oats, Barley, Rye and other Grasses.

Black Stem Rust as it appears on the leaves of the Common Barberry



Enlarged single leaf



Plump healthy grain



Shriveled rusted grain

DANGEROUS NEIGHBORS



Common Barberry Bushes growing near grain fields

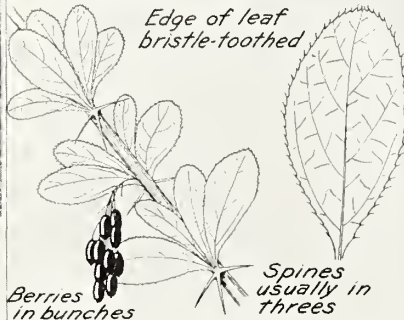
Report Common Barberry bushes you may find to your State Leader of Barberry Eradication.



Common Barberry is harmful, destroy

COMMON BARBERRY

*Edge of leaf
bristle-toothed*

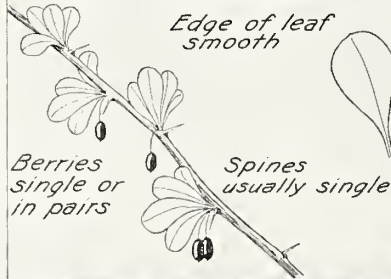


*Berries
in bunches*

*Spines
usually in
threes*

JAPANESE BARBERRY

*Edge of leaf
smooth*



*Berries
single or
in pairs*

*Spines
usually single*

Japanese Barberry is harmless, do not destroy



Certain varieties of wheat, oats, and barley that are more disease-resistant than others have been produced by plant breeders. Wherever these varieties meet the requirements of a given region and are desirable from the standpoints of yield, milling quality, and resistance to other cereal diseases, they should be substituted for the less satisfactory varieties.

New Strains of Destructive Black Stem Rust Develop on the Common Barberry

The production of rust-resistant varieties of grains probably will be much more successful when all common barberry bushes have been eradicated. The reason for this is shown in the recent important discoveries made in the Canadian Rust Research Laboratories at Winnipeg and by E. C. Stakman and his coworkers at the University of Minnesota. Both of these groups conducting independent research have proved that entirely new strains of stem rust are produced if two different rust forms crossbreed on barberry leaves. The certainty that new forms of the dangerous disease may appear suddenly, makes the eradication of the common barberry all the more imperative, since it is on the barberry alone that this crossing can occur. The new and apparently resistant varieties of grains are not safe with barberries near. If for no other reason than to protect the new kinds of superwheat which are now in the process of being developed, all common barberry bushes should be destroyed.

Survey Activities

Surveys are made in the spring, summer, and fall months. The original survey was completed in 1924. Later it became necessary to re-survey properties where barberries had been found, because of the probable appearance of sprouting bushes, seedlings, and escaped bushes.

On the original survey little attention had been given to rivers, ditches, fence rows, or groves, the general opinion being that barberry bushes had not escaped cultivation. Later it was discovered that thousands of bushes had escaped from cultivation and were growing in such places. A second survey therefore seemed to be necessary and was conducted in several counties to find not only these escaped bushes, but those overlooked on the original survey.

Up to the completion of the original survey, 22,898 common barberry bushes were found on approximately 1,659 properties. Most of these bushes were dug and the sprouts destroyed on subsequent resurveys.

Salt applied to the crown of the bush is a very effective killing agent and has aided greatly in barberry eradication in Colorado.

Summary of Progress in 1929

In 1929 the second survey was conducted in Boulder, Adams, Arapahoe, and Denver Counties. In all except Denver County the survey was

completed. Two teams of two men each were directed by the State Leader, who also worked with them at various times. All properties, rivers, ditches, woodlots, and fence rows were thoroughly gone over. There were found and eradicated in these counties 215 common barberry bushes and 1,741 seedlings on 58 properties. A resurvey also was made at the same time, and 15 sprouting bushes were found on 9 properties.

It is interesting to note that most of the barberry bushes found on this second survey were escaped bushes. One large area five miles in extent was found outside of Farmont Cemetery in Arapahoe County.

Education and Publicity

Educational and publicity activities were emphasized again in 1929. Materials for study were mailed to about 700 schools, including grade schools, high schools, and colleges. Forty-seven window displays were placed in various stores, banks, etc. Fourteen meetings were held at which speakers were asked to give talks on barberry eradication. Four radio talks were given from station KOA in Denver, and 138 articles were published in farm papers. As a result of these activities 14 reports were received which led to finding 23 barberry bushes on 8 properties.

Investigation

This year a close check was made of areas where barberry bushes had been eradicated. Very little stem rust was found. Rust was found more abundantly in areas where infected barberry bushes occurred. In past years infected bushes have spread rust for many miles, causing severe epidemics. Since these bushes, approximately 50,000 in number, have been eradicated, little injury from rust has occurred. In Colorado barberry bushes become infected early in the spring, infection having been found as early as May 8. Rust spreads from these early sources are dangerous.

Studies are being made of the growth habits and infection of Berberis vulgaris at different altitudes. Overwintering of the red-rust stage under Colorado conditions also has been investigated.

Conclusions

The big rust epidemics of 1904 and 1916 have proved that millions of bushels of grain are lost by the fungus causing black stem rust. The common barberry is necessary for the completion of the life cycle of the stem-rust fungus. In Colorado it spreads rust to wheat, oats, barley, rye, and some 50 or more wild grasses.

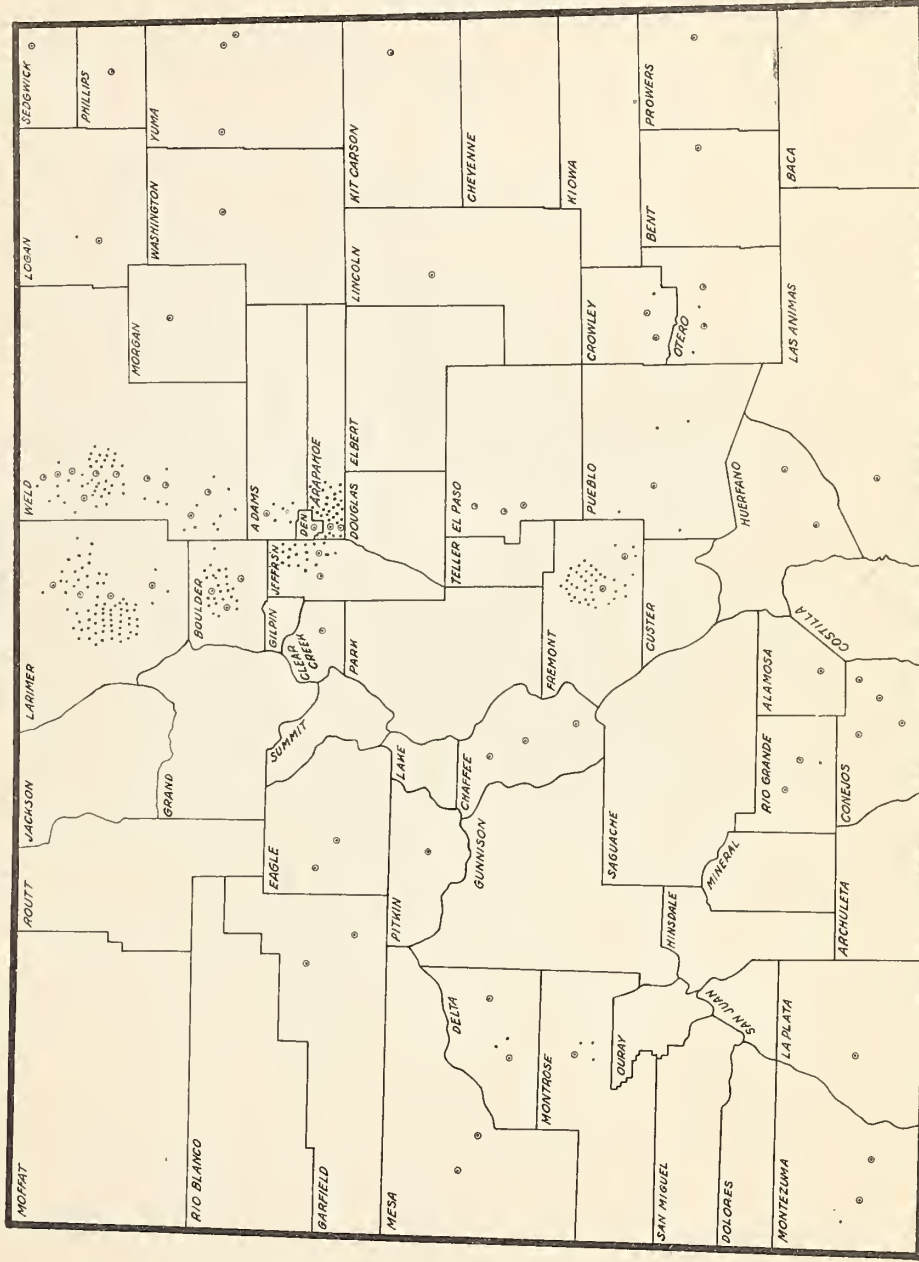
Common barberry bushes produce great numbers of seeds, which are relished by birds. Seeds spread in this manner cause barberries to grow in many obscure places, and thorough surveys are necessary to locate them.

Barberry eradication is the cheapest insurance against the heavy losses caused by black stem rust, and every citizen should assist in this campaign by reporting all findings to Barberry Eradication, Botany Department, Colorado Agricultural College, Fort Collins, Colo.

March 1, 1930.

PROPERTIES HAVING BARBERRY BUSHES 1918-1929

COLORADO



1,875 PROPERTIES
49,672 BUSHES

FARMS HAVING BARBERRY BUSHES
TOWNS HAVING BARBERRY BUSHES

Common Barberry Spreads Black Stem Rust

Know Common Barberry

Look For It!

*When you find
a spiny bush
with-*

*Edges of leaves
like this*



Spines like these



Berries like these



Inner bark yellow



*It is a
Common Barberry
and should be
reported at once*

*Spread of
Barberries by
birds*

*Birds eat the
berries*



*Carry them to their
roosting places*



*Where they cough
up the seeds*



*From which seedling
bushes grow*



*They in time
bear fruit which
is again carried
farther on*

Look For and Report All Common Barberry Bushes

To the State Leader of Barberry Eradication, in care of your State Department
of Agriculture or your State Agricultural College.

Common Barberry Bushes

spread

Black Stem Rust

to

WHEAT, OATS,
BARLEY, RYE,
and Many Wild
Grasses

THIS Progress Report is prepared and printed by the Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C. The cover is furnished by the Conference for the Prevention of Grain Rust, 300 Lewis Building, Minneapolis, Minnesota.